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SOS-inducible DNA polymerases and adaptive mutagenesis

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Abstract

Stability of genomes of living organisms is maintained by various mechanisms that ensure high fidelity of DNA replication. However, cells can reversibly enhance the level of replication errors in response to external factors. As mutable states are potentially involved in carcinogenesis, aging, and resistance for pathogenic agents, the existence of these states is of great importance for human health. A well-known system of inducible mutation is SOS response, whose key component is replication of damaged DNA regions. Inducible mutation implies a contribution of SOS response to the adaptation of a bacterial population to adverse environments. There is ample evidence indicating the primary role of SOS response genes in the phenomenon of adaptive mutation. The involvement of the SOS system in adaptive mutagenesis is discussed.

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